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10/664,508	09/16/2003	Terutake Kadohara	B588-554 (25815,566)	1754
26272 7590 03/10/2011 COWAN LIEBOWITZ & LATMAN P.C. JOHN J TORRENTE 1133 AVE OF THE AMERICAS NEW YORK, NY 10036				
EXAMINER				
CUTLER, ALBERT H				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/664,508

Applicant(s)

KADOHARA, TERUTAKE

Examiner

ALBERT H. CUTLER

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is responsive to communication filed on January 26, 2011.

Response to Arguments

2. Applicant's arguments filed January 26, 2011 have been fully considered but they are not persuasive.

3. Applicant argues, with respect to claims 1 and 6, that the cited Lin, et al., TeWinkle, and Okisu, et al. patents, alone or in combination with one another, do not teach or suggest a correction device that simultaneously corrects, by a gain correction, a difference between levels of output signals from the first light receiving area and the second light receiving area, and a difference between levels of output signals of output channels included in the same channel.

4. The Examiner respectfully disagrees. Lin et al. teaches a correction device (2) that simultaneously corrects, by a gain correction ("gain and offset correction", column 5, lines 42-51), a difference between levels of output signals from the first light receiving area and the second light receiving area (Chip to chip correction is performed as detailed in column 5, lines 8-16. See also column 5, lines 42-58.), and a difference between levels of output signals of output channels (The chip to chip correction corrects differences between levels of output signals, as discussed above. The output signals are "of output channels" as each chip includes a different output channel for outputting image signals therefrom, column 4, lines 18-23.). TeWinkle teaches that the output channels are included in the same channel (All of the chips (I, II, etc.) are connected in serial such that they are all output onto a "common output line" such that the set of

chips "in effect acts as one large chip with a single shift register", column 4, line 62 through column 5, line 12, figure 7.).

5. Applicant argues, with respect to claims 1 and 6, that nowhere does Lin, et al. describe the chips of the multi-chip sensor being formed on a surface of the multi-chip image sensor by a plurality of divisional joint exposure operations, and thus, Lin, et al. cannot and does not teach or suggest the image sensing element recited in applicant's claims.

6. The Examiner respectfully disagrees. Lin et al. teaches that the chips of the multi-chip sensor are formed by a plurality of divisional exposure operations (The multi-chip imaging array has a plurality of chips bonded together or otherwise arranged to form an array, column 3, lines 62-64. Variations in manufacturing cause the imaging elements to output different signals, column 4, lines 56-59. An example of this is variations in color filter thicknesses, but the variations can be caused by other factors, column 4, lines 59-61. As the multi-chip sensor is formed of different chips, which differ because of variations in manufacturing, the Examiner interprets the multi-chip sensor to be formed by a plurality of divisional exposure operations.). Lin et al. does not explicitly teach that the chips are formed on the surface of a semiconductor substrate. However, this is taught by TeWinkle (see claim 1 rationale).

7. Applicant argues, with respect to claims 1 and 6, that Lin et al. is completely silent as to any variations caused by the divisional joint exposure operations that form the first and second light receiving areas integrally connected to form a single image sensing surface of the image sensing element.

8. The Examiner respectfully disagrees. Lin et al. teaches that variations in manufacturing cause the imaging elements to output different signals, column 4, lines 56-59. An example of this is variations in color filter thicknesses, but the variations can be caused by other factors, column 4, lines 59-61.
9. Applicant argues, with respect to claims 1 and 6, that in applicant's claimed invention, the image sensing element is manufactured with a single image sensing surface, which is formed by connecting at least first and second areas formed by a plurality of divisional joint exposure operations. That is, the image sensing element recited in applicant's claims has a single image sensing surface that includes two light receiving areas which are integral parts of the single image sensing surface of a single image sensing element. In contrast, though TeWinkle describes that the image sensor array acts in effect as one large chip, the image sensor array of TeWinkle includes multiple discrete chips arranged next to one another, with each chip having its own image sensing surface, and thus, the image sensor of TeWinkle has multiple image sensing surfaces.
10. The Examiner respectfully disagrees. Although each chip has its own image sensing surface, the chips combine to form a single image sensing surface. The top surface of the array of chips is a single image sensing surface.
11. Applicant argues, with respect to claims 1 and 6, that TeWinkle makes no mention of the image sensor array having chips that have been formed on a surface of the image sensor array by a plurality of divisional joint exposure operations.

12. The Examiner respectfully disagrees. TeWinkle teaches an array of chips (I, II, etc., figure 1) formed on the surface of a substrate (14, column 3, lines 2-17). As the chips are separate chips (column 2, line 64 through column 3, line 1), they are separately manufactured (i.e. by a plurality of divisional joint exposure operations). Additionally, Lin et al. teaches that chips are manufactured by a plurality of divisional joint exposure operations, as outlined above.

13. Applicant argues, with respect to claims 1 and 6, that TeWinkle makes no mention of a correction device that simultaneously corrects, by a gain correction, a difference between levels of output signals from the first light receiving area and the second light receiving area, and a difference between levels of output signals of output channels included in the same channel, as recited in applicant's independent claims.

14. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Lin et al. teaches the correction device, and TeWinkle teaches that the output channels are included in the same channel, as discussed above.

15. In addition to the arguments presented above, the Examiner notes that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113. The Examiner has found nothing in the claims that would result in a sufficiently different product from that taught by the prior art.

16. MPEP 2113 additionally recites “[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith.” In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

17. The Examiner upholds that the prior art discloses a product which reasonably appears to be either identical with or only slightly different than the claimed product, and therefore, the rejection under 35 USC 103 is proper.

18. Therefore, the rejection is maintained by the Examiner.

Claim Rejections - 35 USC § 103

19. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

20. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 6,069,973) in view of TeWinkle (US 7,164,506) and Okisu et al. (US 6,571,022).

21. The Examiner's response to Applicant's arguments, as outlined above, is hereby incorporated into the rejection of claims 1-10 by reference.

Consider claim 1, Lin et al. teaches:

An image sensing apparatus (color copier, 100, figure 1) comprising:

an image sensing element (imaging array, 1, figure 2) includes a first light receiving area (chip 3A) and a second light receiving area (chip 3B) which are formed by a plurality of divisional joint exposure operations (A plurality of chips (3) are bonded together or otherwise arranged to form an array, column 3, lines 62-64. As the first light receiving area (3A) and second light receiving area (3B) are different chips (i.e. formed separately), the Examiner interprets them to be formed by a plurality of divisional joint exposure operations.);

a correction device which corrects difference between output levels of pixel signals output from the first light receiving area and the second light receiving area, wherein said correction device simultaneously corrects, by a gain correction, a

difference between levels of output signals from the first light receiving area and the second light receiving area, and a difference between levels of output signals of output channels (The data processor (2, figures 1 and 2) provides image signal correction, column 3, lines 31-34. The image signal correction includes chip-to-chip correction (i.e. correction between output levels of respective light receiving areas) wherein the chips are corrected to output uniform image signals, as detailed in column 5, lines 8-16, step 200 of figure 3. The chip to chip correction corrects differences between levels of output signals, as discussed above. The output signals are "of output channels" as each chip includes a different output channel for outputting image signals therefrom, column 4, lines 18-23.).

However, Lin et al. does not explicitly teach that first and second light receiving areas are formed on an image pickup surface of a semiconductor substrate, or that pixel signals obtained by the first light receiving area and the second light receiving area are read out from the image sensing element via a same channel.

TeWinkle similarly teaches an image sensing apparatus (figure 7) comprising an image sensing element ("image sensor array chips", 12) manufactured by a plurality of divisional exposure operations such that the image sensing element includes a first light receiving area ("I", figure 7) and a second light receiving area ("II", figure 7) which are formed by the plurality of divisional exposure operations (A plurality of "sensor array chips" (12, i.e. chips manufactured by a plurality of divisional exposures) are butted end to end to form a single array of photosensors on the substrate (14), column 2, line 64 through column 3, line 4.).

However, in addition to the teachings of Lin et al., TeWinkle teaches that the first light receiving area ("I", figure 7) and a second light receiving area ("II", figure 7) are formed on an image pickup surface of a semiconductor substrate (substrate, 14, figure 1, column 3, lines 2-17), and that pixel signals obtained by the first light receiving area and the second light receiving area are read out from the image sensing element via a same channel (All of the chips (I, II, etc.) are connected in serial such that they are all output onto a "common output line" such that the set of chips "in effect acts as one large chip with a single shift register", column 4, line 62 through column 5, line 12, figure 7.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the first and second light receiving areas taught by Lin et al. connected in serial on a semiconductor substrate such that they read out from the image sensing element via a same channel as taught by TeWinkle as a way of combining prior art elements (i.e. the chips taught by Lin et al.) according to known methods (i.e. as taught by TeWinkle) to yield predictable results such as the output of image data in a single serial stream (TeWinkle, column 4, lines 66-67).

However, the combination of Lin et al. and TeWinkle does not explicitly teach a control device which controls to write a signal corrected by said correction device to a frame memory.

Okisu et al. similarly teaches an image sensing apparatus (camera, figures 2 and 8) comprising an image sensing element having a first light receiving area (CCD, 12) and a second light receiving area (CCD, 13, See figures 2 and 8, column 6, lines 16-27. Two color image pickup devices (12 and 13) are situated behind the lens (2) to capture

left and right partial images.), and a correction device which corrects a pixel signal output from said image sensing element (See figures 8 and 9. The image sensing element (12, 13) outputs signals to an image processor (19). The image processor (see figure 9) contains a shading corrector (194, i.e. a correction device), column 7, lines 61-67. The shading corrector (194) corrects output levels of pixels of the image sensing element (12, 13), column 8, lines 19-22.).

However, Okisu et al. further teaches a control device (card drive controller, 20, figure 8) which controls to write signals corrected by said correction device to a frame memory (Synthesized image data is written to an HD card (10, i.e. frame memory) by the card controller (20), column 7, lines 22-42.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a control device which controls to write signals corrected by said correction device to a frame memory as taught by Okisu et al. in the image sensing apparatus taught by the combination of Lin et al. and TeWinkle for the benefit of enabling future retrieval and viewing of the image data.

Consider claim 2, and as applied to claim 1 above, Lin et al. further teaches that said correction device divides the light receiving area into a plurality of blocks, and performs correction using a different correction value for each block (pixel-by-pixel (i.e. block-by-block) correction is performed as detailed in step 100 of figure 3, column 4, line 67 through column 5, line 7.).

Consider claim 3, and as applied to claim 1 above, TeWinkle further teaches that the light receiving areas include at least three partial image sensing regions in one direction (see I, II, etc., figure 7). Lin et al. also teaches that the light receiving areas include at least three partial image sensing regions in one direction (see 3A-3D, figure 2). Lin et al. teaches that different correction values are used for individual linear arrays (see claim 1 rationale). However, the combination of Lin et al. and TeWinkle does not explicitly teach that said correction device corrects at least two of the three partial image sensing regions with correction values by using as a reference a central partial image sensing region selected from the three partial image sensing regions.

However, Okisu et al. further teaches:

The light receiving areas (12, 13) include at least three partial image sensing regions in one direction, and said correction device corrects at least two of the three partial image sensing regions with correction values by using as a reference a central partial image sensing region selected from the three partial image sensing regions (Okisu et al. teaches that three or more image pickup regions (i.e. light receiving areas) can be used, column 23, line 64 through column 24, line 2. Okisu et al. further teaches normalizing the pixel values to the center of a light receiving surface (i.e. a central partial image sensing region), column 9, lines 50-55.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the central image sensing region taught by the combination of Lin et al. and TeWinkle as a reference as taught by Okisu et al. to obtain

predictable results such as image data normalized to the central image sensing region while applying a known technique to a known device.

Consider claim 4, and as applied to claim 1 above, Lin et al. further teaches that said correction device performs correction using different correction values in a boundary direction between light receiving elements (Pixel-by-pixel (i.e. block-by-block) correction is performed as detailed in step 100 of figure 3, column 4, line 67 through column 5, line 7. This includes any pixels in a boundary direction.)

Consider claim 5, and as applied to claim 1 above, Lin et al. further teaches that said correction device performs correction using a different correction value for each color (Non-uniformity due to the different color filters is corrected for, as detailed in column 5, lines 8-16).

Claim 6 recites an image sensing apparatus similar to the image sensing apparatus recited in claim 1, and matching features are rejected using the same rationale (see claim 1 above). Lin et al. teaches that the first and second light receiving areas form a single image sensing surface of the image sensing element by connecting the first and second light receiving areas with each other after divisional joint exposure operations are performed in a manufacturing process of the image sensing element (A plurality of chips (3) are bonded together or otherwise arranged to form an array, column 3, lines 62-64. As the first light receiving area (3A) and second light receiving

area (3B) are different chips (i.e. formed separately during a manufacturing process), the Examiner interprets them to be formed by a plurality of divisional joint exposure operations.).

Consider claim 7, and as applied to claim 6 above, Lin et al. teaches that the image sensing element outputs a signal from a different output unit for each light receiving area (column 4, lines 18-23), and that a different correction value is used for each linear array and thus each output unit (see claims 1 and 6 rationale).

TeWinkle also teaches that the image sensing element outputs a signal from a different output unit for each light receiving area (A different output (SROUT) is provided for each light receiving area (I, II, etc.) of the image sensing element, figure 7, column 5, lines 4-12.).

Consider claim 8, and as applied to claim 6 above, Lin et al. further teaches that said correction device performs correction using a different correction value for each lens (Correct values are determined based upon received illumination, which is a factor of the lens used, column 4, lines 56-64.). Okisu et al. teaches the use of a lens (2, figure 8).

Consider claim 9, and as applied to claim 6 above, the combination of Lin et al. and TeWinkle does not explicitly teach that correction is performed using a different correction value for each exit pupil position of an optical system.

Okisu et al. further teaches that correction is performed using a different correction value for each exit pupil position of an optical system (Different correction values are used for each pixel, column 9, lines 55-58. Each pixel has a separate lens which has a different optical characteristic, which different optical characteristic would cause different exit pupil positions. See figures 11-13, column 8, lines 47-58.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the correction device taught by the combination of Lin et al. and TeWinkle use different correction values for different exit pupil positions as taught by Okisu et al. to obtain predictable results such as improving image quality while applying a known technique to a known device.

Consider claim 10, and as applied to claim 6 above, the combination of Lin et al. and TeWinkle does not explicitly teach that correction is performed using a different correction value for each F-number.

Okisu et al. further teaches that correction is performed using a different correction value for each F-number (Different correction values are used for each pixel, column 9, lines 55-58. Each pixel has a separate lens which has a different optical characteristic, which different optical characteristic would cause each lens to have a different F-number. See figures 11-13, column 8, lines 47-58.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the correction device taught by the combination of

Lin et al. and TeWinkle use different correction values for F-numbers as taught by Okisu et al. to obtain predictable results while applying a known technique to a known device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT H. CUTLER whose telephone number is (571)270-1460. The examiner can normally be reached on Mon-Thu (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Albert H Cutler/
Examiner, Art Unit 2622